
Curriculum Vitae and Publication List

CRAIG D. ROBERTS

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1 Curriculum Vitae

NAME : Craig Darrian ROBERTS

BIRTHDATE : 1962

NATIONALITY : Citizen of the USA and Australia

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DEGREES OBTAINED :

1988 (May) - PhD, Theoretical Particle Physics,
Flinders University of South Australia

1984 - BSc (Hons), Theoretical Particle Physics,
Flinders University of South Australia.

* Awarded University Medal.

1983 - BSc, Theoretical Physics,
Flinders University of South Australia.

* Awarded Chancellor's Letter of Commendation.

EMPLOYMENT HISTORY :

2001 - Present: Group Leader, Theory

Argonne National Laboratory

Longest-serving leader of the Theory Group

2006 - Present: Senior Physicist (Grade 709, university equivalent – Prof.)

Argonne National Laboratory

2004 - 2006: Physicist (Grade 708, university equivalent – Assoc. Prof. Grade III)

Argonne National Laboratory

2002 - 2004: Physicist (Grade 707, university equivalent – Assoc. Prof. Grade II)

Argonne National Laboratory

1996 - 2001: Physicist (Grade 706, university equivalent – Assoc. Prof. Grade I)

Argonne National Laboratory

1991 - 1996: Assistant Physicist (Grade 705, university equivalent – Asst. Prof.)

Argonne National Laboratory

1989 - 1991: Postdoctoral Fellow, Argonne National Laboratory

1987 - 1989: Postdoctoral Fellow, University of Melbourne, Victoria

2 Evidence of impact on and major contributions to the field

2.1 Professional Honors

- 2009: Recipient, [Convocation Medal](#), Flinders University of South Australia
“The Convocation Medal was instituted in 1991 and is one of the highest awards that the University can bestow upon a graduate who has shown outstanding leadership in their profession and/or given service to the community.” “Some of the [previous recipients](#) of the Medal include Professor Rodney Brooks (Head of the Artificial Intelligence Laboratory, MIT), Gale Edwards (International Theatre Director), Dr. Donald Russell (former Australian Ambassador to the USA), Mem Fox AM (author and literacy educator), John Moriarty AM (businessman and Indigenous activist), and Professor Terry Tao (Professor Mathematics at UCLA, Winner of 2006 Fields Medal).”
- 03/2009 - 03/2011: Guest Professor, Peking University, Beijing, China.
In the [2010 World University Rankings - Natural Sciences](#), Peking University is ranked 21st cf. U. Chicago: 16th, Yale U.: 17th, Columbia U.: 23rd.
- 2003: Recipient, [Friedrich Wilhelm Bessel Research Award](#)
[Alexander von Humboldt Foundation](#) ... awarded “...to young, top-flight scientists and scholars from abroad who are already recognized as outstanding researchers in their fields.”
Just five prizes were awarded in nuclear and particle physics in 2003. Craig’s was the only one presented to a US-based scientist.
- 2001: Elected [Fellow of the American Physical Society](#) ... *For significant contributions to continuum modeling of QCD for hadron physics, linking both quark-gluon confinement and dynamical chiral symmetry breaking with light meson observables.*
- 2001-2002: [Mercator-Gastprofessor](#) of the German Research Foundation (DFG)
The programme is designed to enable Universities in Germany to invite highly qualified scientists and scholars (as a rule foreign nationals) from abroad. A Mercator Guest Professorship should provide a visible accent of quality in the host University’s activities.
- 2008: [Gordon Godfrey Fellow](#), School of Physics, University of New South Wales
- 1996: Distinguished Visiting Scholar, Faculty of Science, University of Adelaide

Adjunct appointments:

- 2011 - Present: Adjunct Professor, Department of Physics,
Illinois Institute of Technology, Chicago, Illinois
- 1997 - 2006: Adjunct Research Professor, Kent State University, Kent OH
- 1991 - 1995: Adjunct Research Scientist, Kent State University, Kent OH

2.2 Significance/Impact of Publications

- General Comparison:
 - Total number of citations to 128 published articles in SPIRES– 6573;
average citations/article = 52, which is **4-times the average** for articles posted on the nuclear theory archive: <http://arxiv.org/archive/nucl-th>.
 - Articles, Sec. 3: average no. citations/year/article = 13.3
cf. nuclear theory archive average = 2.3 citations/year/article for published papers posted within this period.
 - Total number of articles with more than 100 citations – 14
Total number of articles in the **top 100** *nucl-th* publications – 5;
NB. Only 41 (out of ≈ 17183 ; i.e., 0.2%) *nucl-th* articles have more citations than Ref. [61] on page 15. (This exposition of continuum Green function methods applied to quantum gauge field theory at nonzero temperature and density is responsible for major growth in this field.)
 - Total number of articles with more than 50 citations – 44
NB. I hold authorship of 0.5% of the articles in the nucl-th archive but my papers are responsible for 4.3% of all nucl-th articles with 50 citations or more.
 - 30% of my published articles have appeared in journals/journal-sections dedicated *to the rapid publication of important new results in nuclear and particle physics*.
- I have 48 articles cited 48 times or more; i.e., an *h-index* of **48**. My *m-index* is **1.85**. (*m-index* = $h\text{-index}/Y$, where Y is the number of years elapsed since publication of an individual's first paper.) These indices and their significance are described in the arXiv article [physics/0508025](http://arxiv.org/abs/physics/0508025), which reports that “A value $m \sim 2$, i.e. an *h-index* of 40 after 20 years of scientific activity, characterizes outstanding scientists, likely to be found only at the top universities or major research laboratories.”

(NB. Verification material available at <http://www.phy.anl.gov/theory/staff/cdr.html>.)

2.3 Professional Service

2.3.1 Community Oversight

- **Editorial**
 - **2011-2013**: Member, Editorial Board, Physical Review C
 - **2002-2004** & **2005-2007** & **2007-2010**, Field Editor (Elementary Particles and Fields) Few Body Systems; viz., three consecutive terms, thus far.
- **Oversight Panels**:
 - 2010–Present**: Member, Advisory Council (Beirat), Institut für Kernphysik, Forschungszentrum Jülich, Germany
 - 2009**: Member, Review Panel for Excited Baryon Analysis Center at JLab;
 - 2007**: Chairman, National Science Foundation Nuclear Theory Proposal Review Panel
 - 2006**: Member, National Science Foundation Nuclear Theory Proposal Review Panel
 - 2004** & **2005** – Member, Science and Technology Review Panel for Thomas Jefferson National Accelerator Facility

- **Referee** – European Physical Journal A; European Physical Journal C; Few Body Systems; Fizika B; International Journal of Modern Physics A; Journal of Physics A; Journal of Physics G; Journal of High Energy Physics; Modern Physics Letters; New Journal of Physics; Nuclear Physics A; Nuclear Physics B; Physical Review Letters; Physics Letters B; Physical Review C; Physical Review D; Progress in Particle and Nuclear Physics
- **Reviewer:** Grant Applications – Argonne Joint Theory Institute; Argonne Strategic Theory Institute; Australian Research Council; Helmholtz Gemeinschaft, Germany; INFN, Italy; International Science Foundation; Netherlands’ Physics Research Council; US Civilian Research & Development Foundation (CRDF); US Department of Energy; US National Science Foundation
- **Reviewer:** PostGraduate Theses – U. Adelaide (2), Sth. Australia; Flinders U. (1), Sth. Australia; U. Rostock, Germany (2).

2.3.2 Community Leadership

- **Executive**
2010-2012 – “Secretary/Treasurer,” Hadron Physics Topical Group, American Physical Society
2008 – “Past-chair” of the Hadron Physics Topical Group, American Physical Society
2007 – “Chair” of the Hadron Physics Topical Group, American Physical Society
2006 – “Chair-Elect” of the Hadron Physics Topical Group, American Physical Society
2005 – “Vice-Chair” of the Hadron Physics Topical Group, American Physical Society
2003 & 2004 – Member, Executive Committee of the Hadron Physics Topical Group, American Physical Society
- **Organiser: 25 International Meetings;** e.g.,
Chairman, Organising Committee of the workshop on “QCD from the Bound-States’ Perspective,” ECT*, Trento, Italy, August 2-6, 2010
- **Member, International Advisory Committee: 19 International Conferences;** e.g., NSTAR11 – Workshop on the Physics of the Excited Nucleon, Jefferson Laboratory, Newport News, VA: May 2011.
- **Planning** – “Key Issues in Hadronic Physics,” briefing paper presented at the Hadronic and Electromagnetic Probes Town Meeting, 1-4/Dec./2000, as part of the USA’s Nuclear Science Year 2001 Long Range Plan process

2.4 Community Impact

- **82 Invited Presentations at International Meetings/Workshops;** e.g., “Keynote on QCD: Exposing the origin of mass”, presented at US-JAPAN JOINT WORKSHOP ON MESON PRODUCTION REACTIONS AT JEFFERSON LAB AND J-PARC, Hilton, Waikoloa Village, Hawaii – 11-12 October 2009
- **Invited Lecturer: 17 Graduate-student Schools and Professional Symposia;** e.g., Lecture series entitled “Connecting mathematics with experiment” presented at DYSON-SCHWINGER EQUATIONS AND FAÀ DI BRUNO HOPF ALGEBRAS IN PHYSICS

AND COMBINATORICS (DSFDB2011), Strasbourg, 27 June - 1 July, 2011
& 3 Lectures entitled *Hadron Physics and Continuum Strong-QCD* presented at the MINI-SCHOOL OF XII MEXICAN WORKSHOP ON PARTICLES AND FIELDS, Physics Department of the University of Sinaloa, Culiacán – 4-8 November 2009

- **Seminars, Colloquia and Lectures** – I have given **220** presentations at research institutes and conferences worldwide.

2.5 Research Coordination

- Since 1996, I have coordinated collaborations involving 44 PhD Scientists and 20 graduate students from 31 different research centres [9 in the USA and another 22 worldwide]
- I oversaw the preparation of a Collaborative Research Agreement between Argonne National Laboratory and the Munich *Excellence Cluster for Fundamental Physics* (<http://www.universe-cluster.de>)
- I oversaw a Collaborative Research Agreement between Argonne National Laboratory, and the Department of Physics and Mathematical Physics and the Special Centre for the Subatomic Structure of Matter at the University of Adelaide

2.6 Graduate Training

Since 1995, I have directly supervised **18** postdoctoral fellows at Argonne National Laboratory, and played an adjunct role in the supervision of 10 PhD students and 2 Diploma Students. NB. The benchmark in the USA is 0.45 postdoctoral-fellows/staff-member/year, whereas I typically supervise two per year; viz., my commitment to postdoctoral fellows is more than 4-times the National average.

Postdoctoral Supervision

1. David Wilson, 2010-present
2. Roberto ANGLANI, 2009-2010
Currently, Student of Nuclear Engineering ... Italy
3. Hovhannes GRIGORYAN, 2008-2010 ... Laboratory Director's Fellow, Argonne National Laboratory
Currently, Postdoctoral Fellow ... Ohio State University
4. Ross YOUNG, 2007-2010 ... Eugene P. Wigner Fellow, Argonne National Laboratory
Currently, Lecturer ... University of Adelaide, Australia
5. Bruno EL-BENNICH, 2007-2009 ... Argonne National Laboratory
Currently, Research Fellow ... Unicsul & IFT, State University of São Paulo, Brazil
6. Thomas KLÄHN, 2007-2009 ... Argonne National Laboratory
Currently, Research Fellow ... University of Wroclaw, Poland
7. Ian CLOËT, 2007-2008 ... Argonne National Laboratory
Currently, Postdoctoral Fellow ... University of Washington in Seattle

8. Mandar BHAGWAT, 2006-2007 ... Argonne National Laboratory
Currently, Postdoctoral Fellow ... Harvard Medical School
9. Stewart V. WRIGHT, 2004-2006 ... Argonne National Laboratory
Currently ... Financial market analyst, Sydney, Australia
10. Prashanth JAIKUMAR, 2004-2006 ... Argonne National Laboratory
Currently ... Asst. Prof., Institute of Mathematical Sciences, Chennai, India
11. Arne HÖLL, 2003-2005 ... Argonne National Laboratory
Currently ... Asst. Head of Division – Energy Research, German Federal Ministry of
Economics and Technology
12. Andreas KRASSNIGG, 2003-2005 ... Argonne National Laboratory
Erwin Schrödinger Fellow, Funded by Austrian Ministry of Education,
Winner of 2002 Austrian Prize for Academic Excellence
Currently ... Research Fellow, Institut für Physik, Universität Graz, Austria
13. Martin HECHT, 2000-2001
Currently ... Patent Lawyer, Melbourne, Australia
14. Sebastian SCHMIDT, 1999-2000
Fiodor Lynen Fellow, Funded by Alexander von Humboldt Foundation
Currently ... Research Centre Jülich, Germany: Member of the Board of Directors, with
responsibility for “Structure of Matter, Key Technologies and Health”; and Professor of
Theoretical Physics at the University of Dortmund.
Until 2007 ... Managing Director, Helmholtz Gemeinschaft, Germany
(The Helmholtz Gemeinschaft is Germany’s equivalent of the Department of Energy.)
15. Jacques BLOCH, 1998-1999
Currently ... Research Associate, University of Regensburg, Germany
16. Pieter MARIS, 1996-1998
Currently ... Research Fellow, Department of Physics and Astronomy, Iowa State Uni-
versity, USA
17. Lorenz von SMEKAL, 1996-1997
Currently ... Lecturer, University of Adelaide, Australia
18. Axel BENDER, 1995-1996
Currently ... Officer for Concept Studies and Analysis, Land Operations Division,
Defence Science and Technology Organisation, Australia

3 Ten significant publications

1. ROBERTS, C.D. and WILLIAMS, A.G.
Dyson-Schwinger Equations and their Application to Hadronic Physics
hep-ph/9403224; [Prog. Part. Nucl. Phys. 33 \(1994\) pp. 477-575.](#)
Citations: [512] ... *First major exposition of the application of continuum Green function methods to diverse strong coupling phenomena in quantum gauge field theory. A leading theme-setting paper in nuclear and particle physics (see page 9).*
2. ROBERTS, C. D.
Electromagnetic pion form-factor and neutral pion decay width
hep-ph/9408233; [Nucl. Phys. A 605 \(1996\) pp. 475-495.](#)
Citations: [125] ... *Pioneering symmetry-preserving study of hadron electromagnetic properties. (Here symmetry preserving includes: Poincare' covariant, electromagnetic current and chiral current. NB. Lattice-QCD is not symmetry preserving.) Before this publication, no one had achieved a unified treatment of a pion's strong, weak and electromagnetic properties. This paper provides the foundation for all subsequent studies of strong and electroweak properties of hadrons. This is the first study to demonstrate the essential interplay between dynamical chiral symmetry breaking (DCSB) and anomalies in gauge field theories.*
3. BENDER, A., ROBERTS, C.D. and SMEKAL, L. v.
Goldstone Theorem and Diquark Confinement Beyond Rainbow-Ladder Approximation
nucl-th/9602012; [Phys. Lett. B 380 \(1996\) pp. 7-12.](#)
Citations: [207] ... *This study introduced what remains today the only extant nonperturbative and systematic symmetry-preserving truncation scheme of the Dyson-Schwinger Equations - the Euler-Lagrange equations of quantum field theory. It laid the foundation for what is the only continuum approach to QCD that is making any progress.*
4. MARIS, P., ROBERTS, C. D. and TANDY, P. C.
Pion mass and decay constant
nucl-th/9707003; [Phys. Lett. B 420 \(1998\) pp. 267-273.](#)
Citations: [215] ... *First proof of Goldstone's theorem in quantum chromodynamics. Numerous corollaries identified. All have wide-ranging impact in both the perturbative and nonperturbative domains. Implications of the results proved are still being uncovered; e.g., relevant to excited and hybrid pseudoscalar mesons and to the $U_A(1)$ anomaly.*
5. MARIS, P. and ROBERTS, C. D.
 π - and K -meson Bethe-Salpeter amplitudes
nucl-th/9708029; [Phys. Rev. C 56 \(1997\) pp. 3369-3387.](#)
Citations: [247] ... *First manifestly Poincaré covariant and symmetry preserving calculation of pseudoscalar meson properties. This study provided proof in principle that hadron observables could be used to map out the long-range interaction between light-quarks; i.e., to use experiment to determine the unique β -function in QCD. The*

study illustrates some of the exact results proved in Ref. [4]. It is the foundation paper for the most successful extant phenomenology of pseudoscalar and vector meson properties.

6. IVANOV, M. A., KALINOVSKY, Yu. L. and ROBERTS, C. D.
Survey of heavy meson observables
 nucl-th/9812063; [Phys. Rev. D 60 \(1999\) 034018](#), 17 pages.
 Citations: [114] ... *Article proves exact results for systems containing one light and one heavy quark; establishes that a long held assumption based on non-relativistic quark models is a corollary of the proof given; and provides first unified symmetry-preserving treatment of light- and heavy-quark systems.*

7. HECHT, M. B., ROBERTS, C.D. and SCHMIDT, S.M.
Valence Quark Distributions in the Pion
 nucl-th/0008049; [Phys. Rev. C 63 \(2001\) 025213](#) (8 pages).
 Citations: [73] ... *First calculation of valence quark distribution in a bound state that is both a quark-antiquark composite and a Goldstone mode. Result reignited debate about the true form of the distribution in the valence region. The predictions were verified in 2010, providing a crucial confirmation of the Standard Model.*

8. HÖLL, A., KRASSNIGG, A. and ROBERTS, C.D.,
Pseudoscalar Meson Radial Excitations
 nucl-th/0406030; [Phys. Rev. C 70 \(2005\) 042203\(R\)](#) (5 pages)
 Citations: [70] ... *Proof in quantum chromodynamics that ground state pion lifetime is short because of magnitude of DCSB, and that when chiral symmetry is dynamically broken all pseudoscalar mesons except the ground state must decouple from the weak interaction in the limit of massless quarks. Establishes that effects of DCSB are felt over a wide range of energy scales.*

9. BHAGWAT, M.S., CHANG, L., LIU, Y.X., ROBERTS, C.D. and TANDY, P.C.
Flavour symmetry breaking and meson masses
 arXiv:0708.1118 [nucl-th]; [Phys. Rev. C 76 \(2007\) 045203](#) (10 pages)
 Citations: [23] ... *Proves novel results in quantum chromodynamics that relate to the absence of a ninth Goldstone mode and the longstanding $U_A(1)$ problem. For example, establishes a necessary and sufficient condition for the absence of a ninth light pseudoscalar meson in QCD.*

10. LEI, C and ROBERTS, C.D., **Sketching the Bethe-Salpeter kernel**
 arXiv:0903.5461 [nucl-th]; [Phys. Rev. Lett. 103 \(2009\) 081601](#) (4 pages)
 Citations: [42] ... *Based on an essentially new form of the Bethe-Salpeter equation, we derived a Ward-Takahashi identity that enables one to construct a symmetry-preserving Bethe-Salpeter for any reasonable dressed-vertex in the gap equation. This solves a sixty-year-old problem and makes possible a truly reliable analysis of the spectrum of mesons.*

Comments on Significance and Impact

These ten articles highlight my contributions to the theory of relativistic quantum field theory and the phenomenology of hadron and particle physics. My contributions to hadron physics were recognised by election to Fellowship of the American Physical Society in 2001:

“For significant contributions to continuum modeling of QCD for hadron physics, linking both quark-gluon confinement and dynamical chiral symmetry breaking with light meson observables.”

Here some additional observations are appended.

- In a 2002 analysis of 63 128 publications in the SPIRES High-Energy Physics Database, Publication 1. in this list:

“Dyson-Schwinger Equations and their Application to Hadron Physics”

was identified as the fundamental reference for the *fourth* most important research theme in contemporary high-energy and nuclear physics. (143 distinct themes were identified.)

- Publication Impact

NB. All citation information is compiled from the SPIRES data base:

slac.stanford.edu/spires/hep/

	average citations/article			
“Ten Best”	163			
	no. published articles	average citations/pub.article	h-index	m-index
Career Figures	127	52	48	1.85

For explanations of the “h” and “m” indices, refer to *An index to quantify an individual’s scientific research output*, J.E. Hirsch (UC, San Diego): physics/0508025, which reports that “A value $m \sim 2$, i.e. an h-index of 40 after 20 years of scientific activity, characterizes outstanding scientists, likely to be found only at the top universities or major research laboratories.”

Reference Comparison ... August ’11

Preprint Archives – “arXiv” <http://arxiv.org/>,

indexed through “SPIRES” <http://www-spires.fnal.gov/spires/hep/>

	No. articles in arXiv	average no. citations/article
primarch: nucl-th	17 183	14

The citation rate for my top-ten articles is 12-times the nuclear-theory average and, overall, my citation rate is 3.6-times the average.

4 Principal Publications

Refereed Journal Articles	108
[Articles selected for expedited publication	32]
Submitted Journal Articles	3
Refereed Conference Proceedings	28
SPIRES: ave. 52 citations/published-article	
<i>seven refereed articles missing from SPIRES data base</i>	

4.1 Refereed Articles (108)

1. CAHILL, R.T. and ROBERTS, C.D.
Soliton bag models of hadrons from QCD.
Phys. Rev. D 32 (1985) 2419.
2. ROBERTS, C.D. and CAHILL, R.T.
Dynamically selected vacuum field configuration in massless QED
Phys. Rev. D 33 (1986) 1755.
3. ROBERTS, C.D. and CAHILL, R.T.
A bosonisation of QCD and realisations of chiral symmetry
Aust. J. Phys. 40 (1987) 499.
4. PRASCHIFKA, J., ROBERTS, C.D. and CAHILL, R.T.
A study of $\rho \rightarrow \pi\pi$ decay in a global colour model for QCD
Int. J. Mod. Phys. A 2 (1987) 1797.
5. PRASCHIFKA, J., ROBERTS, C.D. and CAHILL, R.T.
QCD bosonisation and the meson effective action
Phys. Rev. D 36 (1987) 209.
6. CAHILL, R.T., ROBERTS, C.D. and PRASCHIFKA, J.
Calculation of diquark masses in QCD
Phys. Rev. D 36 (1987) 2804.
7. CAHILL, R.T., ROBERTS, C.D. and PRASCHIFKA, J.
Why baryons are not skyrmions
Aust. J. Phys. 41 (1988) 11.
8. PRASCHIFKA, J., CAHILL, R.T. and ROBERTS, C.D.
Chiral QCD generates constituent quark masses
J. Mod. Phys. Lett. A 3 (1988) 1595. [E] 1
9. ROBERTS, C.D., CAHILL, R.T. and PRASCHIFKA, J.
The effective action for the Goldstone Modes in a global colour symmetry model of QCD
Ann. Phys. 188 (1988) 20.

10. ROBERTS, C.D., CAHILL, R.T. and PRASCHIFKA, J.
QCD and a calculation of the ω - ρ mass splitting
Int. J. Mod. Phys. A 4 (1989) 719.
11. CAHILL, R.T., ROBERTS, C.D. and PRASCHIFKA, J.
Baryon structure and QCD
Aust. J. Phys. 42 (1989) pp. 129-145.
12. ROBERTS, C. D., PRASCHIFKA, J. and CAHILL, R. T.
A Chirally Symmetric Effective Action For Vector And Axial Vector Fields In A Global Color Symmetry Model Of QCD
Int. J. Mod. Phys. A 4 (1989) 1681.
13. PRASCHIFKA, J., CAHILL, R. T. and ROBERTS, C. D.
Mesons And Diquarks In Chiral QCD: Generation Of Constituent Quark Masses
Int. J. Mod. Phys. A 4 (1989) 4929.
14. ROBERTS, C. D.
Nonlinear Quantum Mechanics: Two Possibilities
Mod. Phys. Lett. A 5 (1990) 91. [E] 2
15. ROBERTS, C. D. and MCKELLAR, B. H. J.
Critical Coupling For Dynamical Chiral Symmetry Breaking
Phys. Rev. D 41 (1990) 672.
16. WILLIAMS, A. G., KREIN, G. and ROBERTS, C. D.
Modelling the quark propagator
Annals Phys. 210 (1991) 464.
17. BURDEN, C. J. and ROBERTS, C. D.
Light Cone Regular Vertex In Quenched QED In Three-Dimensions
Phys. Rev. D 44 (1991) 540.
18. BURDEN, C.J., ROBERTS, C.D. and WILLIAMS, A.G.
Singularity structure of a model quark propagator
Phys. Lett. B 285 (1992) 347. [E] 3
19. ROBERTS, C.D. WILLIAMS, A.G. and KREIN, G.
On the Implications of Confinement
Int. J. Mod. Phys. A 7 (1992) 5607.
20. BURDEN, C.J., PRASCHIFKA, J. and ROBERTS, C.D.
Photon Polarisation tensor and gauge dependence in three-dimensional quantum electrodynamics
hep-th/9303098, Phys. Rev. D46 (1992) 2695.
21. HOLLENBERG, L.C.L., ROBERTS, C.D. and McKELLAR, B.H.J.
Two loop calculation of the ω - ρ mass splitting
Phys. Rev. C 46 (1992) 2057.

22. BURDEN, C.J. and ROBERTS, C.D.
Gauge covariance and the fermion-photon vertex in three- and four-dimensional, massless quantum electrodynamics
 hep-th/9303098, Phys. Rev. D 47 (1993) 5581.
23. ROBERTS, C.D., CAHILL, R.T., SEVIOR, M.E., IANNELLA, N.
 π - π scattering in a QCD based model field theory
 hep-ph/9304315, Phys. Rev. D 49 (1994) pp. 125-137.
24. HAWES, F.T., ROBERTS, C.D. and WILLIAMS, A.G.
Dynamical chiral symmetry breaking with an infrared vanishing gluon propagator?
 hep-ph/9309263, Phys. Rev. D 49 (1994) pp. 4683-4693.
25. ROBERTS, C.D. and WILLIAMS, A.G.
Dyson-Schwinger Equations and their Application to Hadronic Physics
 hep-ph/9403224, Prog. Part. Nucl. Phys., 33 (1994) pp. 475-575.
26. MITCHELL, K.L., TANDY, P.C., ROBERTS, C.D. and CAHILL, R.T.
Charge symmetry breaking via ρ - ω mixing from model quark-gluon dynamics
 hep-ph/9403223, Phys. Lett. B 335 (1994) pp. 282-288. [E] 4
27. DONG, Z., MUNCZEK, H.J. and ROBERTS, C.D.
Gauge covariant fermion propagator in quenched, chirally-symmetric quantum electrodynamics
 hep-ph/9403252, Phys. Lett. B 333 (1994) pp. 536-544. [E] 5
28. ALKOFRER, R., BENDER A., ROBERTS, C.D.
Pion loop contribution to the electromagnetic pion charge radius
 hep-ph/9312243, Intern. J. Mod. Phys. A 10 (1995) pp. 3319-3342.
29. FRANK, M.R., MITCHELL, K.L., ROBERTS, C.D. and TANDY, P.C.
Off shell axial anomaly via the $\gamma^*\pi \rightarrow \gamma$ transition
 hep-ph/9412219, Phys. Lett. B 359 (1995) pp. 17-22. [E] 6
30. FRANK, M.R. and ROBERTS, C.D.
Model gluon propagator and pion and rho-meson observables
 hep-ph/9508225, Phys. Rev. C 53 (1996) pp. 390-398.
31. ALKOFRER, R and ROBERTS, C.D.
Calculation of the anomalous $\gamma\pi^* \rightarrow \pi\pi$ form factor
 hep-ph/9510284, Phys. Lett. B 369 (1996) pp. 101-107. [E] 7
32. BURDEN, C.J., ROBERTS, C.D. and THOMSON, M.J.
Electromagnetic Form Factors of Charged and Neutral Kaons
 nucl-th/9511012, Phys. Lett. B 371 (1996) pp. 163-168. [E] 8

33. BENDER, A., ROBERTS, C.D. and v. SMEKAL, L.
Goldstone theorem and diquark confinement beyond rainbow ladder approximation
nucl-th/9602012, Phys. Lett. B 380 (1996) pp. 7-12. [E] 9
34. ROBERTS, C.D.
Electromagnetic Pion Form Factor and Neutral Pion Decay Width
hep-ph/9408233, Nucl. Phys. A 605 (1996) pp. 475-495.
35. HAWES, F.T., WILLIAMS, A.G. and ROBERTS, C.D.
Renormalization and chiral symmetry breaking in quenched QED in arbitrary covariant gauge
hep-ph/9604402, Phys. Rev. D 54 (1996) pp. 5361-5372.
36. BENDER, A., BLASCHKE, D., KALINOVSKY, Yu.L. and ROBERTS, C.D.
Continuum study of deconfinement at finite temperature
nucl-th/9606006, Phys. Rev. Lett. 77 (1996) pp. 3724-3727. [E] 10
37. BURDEN, C.J., LU QIAN, ROBERTS, C.D., TANDY, P.C. and THOMSON, M.J.
Ground-state spectrum of light-quark mesons
nucl-th/9605027, Phys. Rev. C 55 (1997) pp. 2649-2664.
38. KALINOVSKY, Yu.L., MITCHELL, K.L. and ROBERTS C.D.
 $K_{\ell 3}$ and π_{e3} transition form factors
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5 Invited Talks

Invited Talks	82
Invited Lecture Series	17

5.1 Invited Talks (82)

1. **Research Programmes in the Physics Division at ANL**, presented at the 4TH ANNUAL SUMMER SCHOOL IN NUCLEAR PHYSICS RESEARCH, University of Wisconsin at Madison, 20/June/1991.
2. **Schwinger-Dyson Equations: Dynamical Chiral Symmetry Breaking and Confinement**, presented at the WORKSHOP ON QCD VACUUM STRUCTURE, American University of Paris, 1-5 June, 1992.
3. **From π - π Scattering to the Quark-Quark Interaction and Hadronic Faddeev Amplitudes**, presented at the inaugural meeting at the European Centre for Theoretical Physics: THE QUARK STRUCTURE OF BARYONS, Trento, Italy, 4-15 October, 1993.
4. **Can an infrared vanishing gluon propagator confine quarks?** presented at the WORKSHOP ON QUANTUM INFRARED PHYSICS, American University of Paris, 6-10 June, 1994.
5. **QCD and π - π scattering**, presented at the CHIRAL DYNAMICS: THEORY AND EXPERIMENT WORKSHOP, MIT, 25-29 July, 1994.
6. **Dyson-Schwinger Equations and Hadronic Observables in QCD**, presented at the JOINT APRIL MEETING OF THE AMERICAN PHYSICAL SOCIETY AND THE AMERICAN ASSOCIATION OF PHYSICS TEACHERS, Washington DC, 18-21 April, 1995.
7. **Hadronic Observables and QCD**, presented at the 1995 GORDON RESEARCH CONFERENCE ON QCD IN NUCLEAR PHYSICS AND ASTROPHYSICS, Tilton, NH July 24-28, 1995.
8. **QCD at Diverse Length-scales via Dyson-Schwinger Equations**, presented at the WORKSHOP ON NONEQUILIBRIUM PHYSICS AT SHORT TIME-SCALES, Max-Planck Gesellschaft Arbeitsgruppe: "Theoretische Vielteilchenphysik", University of Rostock, Rostock, Germany, 28/Feb./1996.
9. **Probing QCD at Diverse Length-Scales via the Dyson-Schwinger Equations**, presented at the 6TH INTERNATIONAL WORKSHOP ON LIGHT-CONE PHYSICS AND NONPERTURBATIVE QCD, Ames, IA, 3-14/Jun./1996.
10. **Dyson-Schwinger Equations: Diquark Confinement and Goldstone's Theorem**, presented at the 2ND INTERNATIONAL CONFERENCE ON QUARK CONFINEMENT AND THE HADRON SPECTRUM, Como, Italy, 26-30/Jun./1996.

11. **Dyson-Schwinger Equations: Diquark Confinement and Goldstone's Theorem**, presented at the WORKSHOP ON CURRENT PROBLEMS IN THREE BODY PHYSICS, Max-Planck Gesellschaft Arbeitsgruppe: "Theoretische Vielteilchenphysik", University of Rostock, Rostock, Germany, 8-9/Jul./1996.
12. **Photo-hadron processes as a probe of bound-state structure**, presented at the 1996 GORDON RESEARCH CONFERENCE ON PHOTONUCLEAR PHYSICS, Tilton, NH July 29 - Aug 2, 1996.
13. **Continuum order parameter for deconfinement**, presented at the 25TH INTERNATIONAL WORKSHOP ON GROSS PROPERTIES OF NUCLEI AND NUCLEAR EXCITATIONS, Hirschegg, Austria, 13-18/Jan./1997.
14. **Confinement and Hadron Form Factors**, presented at the BONN WORKSHOP ON CONFINEMENT PHYSICS, Institute for Theoretical Physics, University of Bonn, Bonn, Germany, 28/Jul - 8/Aug/97.
15. **Hadrons at extremes of temperature and density**, presented at the WORKSHOP ON NONPERTURBATIVE METHODS IN QUANTUM FIELD THEORY, Special Research Centre for the Subatomic Structure of Matter, University of Adelaide, South Australia, Australia, 2-13/Feb./98.
16. **Probing the QCD running coupling in the infrared**, presented at the WORKSHOP ON PHYSICS WITH 8+ GEV PHOTONS, Carnegie-Mellon University, Pittsburgh, PA 13-14/Mar./98.
17. **Hadron properties at extremes of temperature and density**, presented at the WORKSHOP ON QCD AT FINITE BARYON DENSITY, University of Bielefeld, Bielefeld, Germany 27-30/April/98
18. **Dyson-Schwinger Equations - Connecting small and large length-scales**, presented at the INTERNATIONAL CONFERENCE ON NUCLEAR AND PARTICLE PHYSICS WITH CEBAF AT JEFFERSON LAB, Dubrovnik, Croatia, 3-10/November/1998
19. **Dyson-Schwinger Equations: Confinement and DCSB**, presented at the Workshop on UNDERSTANDING DECONFINEMENT IN QCD, ECT*, Trento, Italy, 1-13/March/1999
20. **Dyson-Schwinger Equations and Hadron Phenomenology**, presented at the Workshop on LIGHT-CONE QCD AND NONPERTURBATIVE HADRON PHYSICS, Centre for the Subatomic Structure of Matter, University of Adelaide, Adelaide, Australia 13-22/Dec./1999
21. **Dyson-Schwinger Equations and Continuum Strong QCD**, presented at the CONFINEMENT RESEARCH PROGRAM, Erwin Schrödinger International Institute for Mathematical Physics" Vienna, Austria, May-Jul./2000
22. **Diquarks and Density**, presented at the Workshop on THE PHYSICS OF NEUTRON STAR INTERIORS, ECT*, Trento, Italy, 19/Jun.-7/Jul./2000

23. **Contemporary Applications of Dyson-Schwinger Equations**, presented at
CONFINEMENT IV: THE 4TH INTERNATIONAL CONFERENCE ON QUARK
CONFINEMENT AND THE HADRON SPECTRUM, Vienna, Austria, 3-8/Jul./2000.
24. **Dyson-Schwinger Equations - Aspects of the Pion**, presented at DPF 2000, the
Annual Meeting of the Division of Particles and Fields of The American Physical
Society, Columbus, OH, 9-12/Aug./2000
25. **Dyson-Schwinger Equations and Few Quark Systems**, presented at the Workshop
on RELATIVISTIC DYNAMICS AND FEW HADRON SYSTEMS, ECT*, Trento, Italy,
6-17/Nov./2000
26. **Character of Goldstone Bosons**, presented at the Workshop on LEPTON
SCATTERING, HADRONS AND QCD, Special Centre for the Subatomic Structure of
Matter (CSSM), Adelaide, Australia, 26/Mar-6/Apr./2001
27. **Dyson-Schwinger Equations: From charge radii to deep inelastic scattering**,
presented at the 9TH INTERNATIONAL SYMPOSIUM ON MESON-NUCLEON PHYSICS
AND THE STRUCTURE OF THE NUCLEON, George Washington University, Washington
DC, 26-31/Jul./2001
28. **Dyson-Schwinger Equations and Continuum QCD**, presented at the Workshop
on QUARKS AND HADRONS IN CONTINUUM STRONG QCD, Universität Tübingen,
Tübingen, Germany, 3-6/Sept./2001
29. **Goldstone boson's valence quark distribution**, presented at the 11TH
LIGHT-CONE WORKSHOP – LIGHT-CONE PHYSICS: PARTICLES AND STRINGS,
ECT*, Trento, Italy, 3-11/Sept./2001
30. **Confinement and dynamical chiral symmetry breaking**, presented at the
INTERNATIONAL CONFERENCE ON QUARK NUCLEAR PHYSICS (QNP2002),
Forschungszentrum Jülich, Jülich, Germany, 9-14/Jun./2002
31. **Poincaré covariant study of hadrons**, presented at the Argonne Theory Institute
HADRON STRUCTURE AND GeV ELECTROWEAK INTERACTIONS, Argonne, IL,
29/Jul.-2/Aug./2002
32. **Pions and the nucleon**, presented at the Workshop on the STRUCTURE OF THE
NUCLEON, ECT*, Trento, Italy, 2-10/Sept./2002
33. **Aspects of dynamical chiral symmetry breaking**, presented at the 5TH
INTERNATIONAL CONFERENCE ON QUARK CONFINEMENT AND THE HADRON
SPECTRUM, Gargnano, Italy, 10-14/Sept./2002
34. **Dyson-Schwinger Equations: A Tool for Hadron Physics**, presented at the
SYMPOSIUM IN HONOUR OF JRG HFNER, Ladenburg, Germany, 19-21/Dec./2002
35. **Quark Distributions in the Pion**, presented at the 2ND INTERNATIONAL
CONFERENCE ON NUCLEAR AND PARTICLE PHYSICS WITH CEBAF AT JLAB
(NAPP 2003), Dubrovnik, Croatia, 26-31/May/2003.

36. **Dyson-Schwinger Equations: A Tool for Hadron Physics**, presented at the 17TH INTERNATIONAL CONFERENCE ON FEW-BODY PROBLEMS IN PHYSICS, Duke University/TUNL, Raleigh, NC, 5-10/Jun./2003
37. **Pions and the Nucleon**, presented at the Workshop on ASPECTS OF NONPERTURBATIVE QCD - HADRONS AND THERMODYNAMICS, Physics Department, University of Rostock, 13-16/Jul./2003
38. **Dyson-Schwinger Equations: The Pion and Related Matters**, presented at the LIGHT CONE WORKSHOP: HADRONS AND BEYOND, Institute for Particle Physics Phenomenology and Grey College, University of Durham, Durham, UK, 5-9/Aug./2003
39. **Confinement, DCSB, Bound States, and the Quark-Gluon Vertex**, presented at QCD DOWN UNDER, Special Research Centre for the Subatomic Structure of Matter (CSSM), Adelaide, 10-19/Mar./2004
40. **Dyson-Schwinger Equations and Observables**, presented at the Helmholtz Foundation's Virtual Institute Workshop on DENSE HADRONIC MATTER AND THE QCD PHASE TRANSITION, Bad Honnef, Germany, 2-4/Jul./2004
41. **Dyson-Schwinger Equations and Observables in Hadron Physics**, presented at the 10TH INTERNATIONAL SYMPOSIUM ON MESON-NUCLEON INTERACTIONS AND THE STRUCTURE OF THE NUCLEON, MENU04, Institute of High Energy Physics, The Chinese Academy of Sciences, Beijing, China, 30/Aug.-4/Sept./2004
42. **A Perspective on Hadron Physics**, presented at the XTH MEXICAN WORKSHOP ON PARTICLES AND FIELDS, Institute of Physics and Mathematics, University of Morelia, Morelia, Mexico, 6-12/Nov./2005.
43. **Symmetries and Bound States**, presented at LIGHT CONE 2006, LIGHT-CONE QCD AND NONPERTURBATIVE HADRON PHYSICS , Minneapolis Campus of the University of Minnesota, 15-19 May, 2006.
44. **Continuum Nonperturbative Hadron Physics**, presented at the IVTH INTERNATIONAL CONFERENCE ON QUARKS AND NUCLEAR PHYSICS, Madrid, 5th-10th June 2006.
45. **Hadron Physics as a Covariant Few Body Problem**, presented at the 18TH INTERNATIONAL IUPAP CONFERENCE ON FEW-BODY PROBLEMS IN PHYSICS, Santos, São Paulo, Brazil, 21-26 August, 2006.
46. **Chiral Dynamics from Dyson-Schwinger Equations**, presented at the 5TH INTERNATIONAL WORKSHOP ON CHIRAL DYNAMICS, THEORY AND EXPERIMENT, Durham/Chapel Hill, NC – September 18-22, 2006
47. **Baryons through the DSQCD looking glass**, presented at the Workshop on CONFINEMENT: CONNECTING THE LIGHT- AND HEAVY-QUARK DOMAINS, ECT* European Centre for Theoretical Studies in Nuclear Physics and Related Areas, Trento, Italy – March 12-16, 2007

48. **Covariance, Dynamics and Symmetries, and Hadron Form Factors**, presented at the Workshop on EXCLUSIVE REACTIONS AT HIGH MOMENTUM TRANSFER, Jefferson Lab, Newport News, VA – May 21-24, 2007
49. **Dynamical Chiral Symmetry Breaking and Hadron Structure**, presented at the Argonne Joint Theory Institute Workshop on STRONG DYNAMICS AND DYNAMICAL CHIRAL SYMMETRY BREAKING, Argonne National Laboratory, Argonne, IL – June 4-5, 2007
50. **Dyson-Schwinger Equations – Achievements and Challenges**, presented at the WORKSHOP ON DYSON-SCHWINGER EQUATIONS AND THEIR APPLICATIONS, Physics Department, Peking University, Beijing, China – August 14-18, 2007
51. **Dynamics, Symmetries, and Hadron Properties**, presented at the 11TH INTERNATIONAL SYMPOSIUM ON MESON-NUCLEON PHYSICS AND THE STRUCTURE OF THE NUCLEON (MENU 2007), IKP, Forschungszentrum Jülich, Germany – September 10-14, 2007
52. **Hadron Properties and Dyson-Schwinger Equations**, presented at the International School of Nuclear Physics, Erice-Sicily – 29TH COURSE: QUARKS IN HADRONS AND NUCLEI – 16-24 September, 2007
53. **Calculation of Parton Distribution Functions**, presented at the Workshop on NONPERTURBATIVE ASPECTS OF FIELD THEORIES, 2007, Instituto de Física y Matemáticas, Universidad Michoacana, Morelia, Michoacán, Mexico – 5-6 November, 2007
54. **Hadron Physics & DSE Perspective**, presented at the XI MEXICAN WORKSHOP ON PARTICLES AND FIELDS, Tuxtla Gutierrez, Chiapas, Mexico – 7-12 November, 2007
55. **Form Factors: A Dyson-Schwinger Equation Perspective**, presented at the WORKSHOP ON HADRON ELECTROMAGNETIC FORM FACTORS, ECT* Trento, Italy – 12-23 May 2008
56. **Hadron Form Factors**, presented at the 2008 ANNUAL USERS' GROUP MEETING, JLab, Newport News, VA – 16-18 June 2008
57. **Hadron Form Factors & DSEs**, presented at LIGHT CONE 2008: RELATIVISTIC NUCLEAR AND PARTICLE PHYSICS, European Physical Society Mulhouse, France – 7-11 July 2008
58. **Poincaré covariant studies of mesons and baryons**, presented at the ELECTROMAGNETIC N-N* TRANSITION FORM FACTORS WORKSHOP, JLab, Newport News, VA – 13-15 October 2008
59. **Charting the long-range interaction between light-quarks**, presented at CLAS12 EUROPEAN WORKSHOP, Genova, Italy – February 25-28, 2009
60. **Toward unifying the description of meson and baryon properties**, presented at 2ND MORELIA WORKSHOP ON NONPERTURBATIVE ASPECTS OF FIELD THEORIES, Morelia, Mexico – March 30 - April 04, 2009

61. **Dynamical chiral symmetry breaking: A keystone of QCD**, presented at DYNAMICS OF SYMMETRY BREAKING, Argonne, IL – April 13-17, 2009
62. **Charting the light-quark interaction**, presented at WORKSHOP ON THE PHYSICS OF EXCITED NUCLEONS - NSTAR2009, Institute of High Energy Physics, Beijing, China – April 19-22, 2009
63. **Sketching the long-range interaction between light quarks**, presented at GHP2009 – THIRD WORKSHOP OF THE APS TOPICAL GROUP ON HADRON PHYSICS, 29 April - 1 May 2009, Denver Colorado
64. **Charting the light-quark interaction**, presented at QCD BOUND STATES: METHODS AND PROPERTIES, 15-19 June 2009, Argonne, Illinois
65. **Nucleon observables via a Faddeev equation**, presented at THREE-BODY DYNAMICS IN HADRON STRUCTURE AND HADRONIC SYSTEMS, 24 July 2009, JLab, Newport News, VA
66. **Dynamics and Expression of Chiral Symmetry Breaking**, presented at HADRON STRUCTURE AND DYNAMICS, 13-14 August 2009, Bad Honnef, Germany
67. **Keynote on QCD: Exposing the origin of mass**, presented at 2009, US-JAPAN JOINT WORKSHOP ON MESON PRODUCTION REACTIONS AT JEFFERSON LAB AND J-PARC, 11-12 October 2010, Hilton, Waikoloa Village
68. **Hadron Physics: The Essence of Matter**, presented at XII MEXICAN WORKSHOP ON PARTICLES AND FIELDS, 9-14 November 2009, Hotel Playa, Mazatlán Sinaloa, Mexico
69. **Empirically charting dynamical chiral symmetry breaking**, presented at ACHIEVEMENTS AND NEW DIRECTIONS IN SUBATOMIC PHYSICS, 15-19 Feb. 2010, Special Research Centre for the Subatomic Structure of Matter, University of Adelaide, Australia
70. **Exposing the Dressed Quark's mass**, presented at the 4TH WORKSHOP ON EXCLUSIVE REACTIONS AT HIGH MOMENTUM TRANSFER, 18-21 May 2010, Thomas Jefferson National Accelerator Facility Newport News, Virginia
71. **Dyson-Schwinger equations: Recent successes and future perspective**, presented at the WORKSHOP ON THE EXTRACTION AND INTERPRETATION OF HADRON RESONANCES AND MULTI-MESON PRODUCTION REACTIONS WITH THE 12 GEV UPGRADE, 27-28 May 2010, Excited Baryon Analysis Center, Thomas Jefferson National Accelerator Facility Newport News, Virginia
72. **Impact of dynamical chiral symmetry breaking on meson structure and interactions**, 11TH INTERNATIONAL WORKSHOP ON MESON PRODUCTION, PROPERTIES AND INTERACTION, 10-15 June 2010, Uniwersytet Jagiellonski, Instytut Fizyki, Kraków, Poland

73. **Measuring the Mass Function**, presented at QCD FROM THE BOUND-STATES' PERSPECTIVE, 2-6 August, ECT*, Trento, Italy
74. **T(r)opical Dyson Schwinger Equations**, presented at T(R)OPICAL QCD 2010: CAIRNS CSSM 2010 WORKSHOP, 26 September - 1 October, Cairns Colonial Club, Cairns, Australia
75. **DSEs for Hadron Physics**, presented at the WORKSHOP ON ADS/CFT AND NOVEL APPROACHES TO HADRON AND HEAVY ION PHYSICS, 11 Oct. - 3 Dec. 2010, KITPC-IAS/CAS, Beijing, China
76. **Baryon Properties from Continuum-QCD**, presented at the 2010 INTERNATIONAL CONFERENCE ON THE STRUCTURE OF BARYONS - BARYONS 2010, Suita Campus, Osaka University, Japan 7-11 December 2010
77. **Baryons a problem in Continuum-QCD**, presented at the 3RD INTERNATIONAL WORKSHOP ON NONPERTURBATIVE METHODS ASPECTS OF FIELD THEORY - MORELIA 2011, Morelia, Michoacan, Mexico, 4-7 April 2011
78. **Dyson-Schwinger equations and the masses of ground and excited-state hadrons**, presented at the 4TH WORKSHOP OF THE APS TOPICAL GROUP ON HADRON PHYSICS - GHP2011, April 27-29, 2011, Anaheim, California
79. **Abelian anomaly and neutral pion production**, presented at the APS APRIL MEETING 2011, April 30 - May 3 2011, Anaheim, California
80. **Observing Dynamical Chiral Symmetry Breaking**, presented at the WORKSHOP ON NUCLEON RESONANCE STRUCTURE IN EXCLUSIVE ELECTROPRODUCTION AT HIGH PHOTON VIRTUALITIES WITH THE CLAS 12 DETECTOR, 16 May 2011, Thomas Jefferson National Accelerator Facility Newport News, Virginia USA
81. **Opportunities and Challenges of the N^* program**, presented at the 8TH INTERNATIONAL WORKSHOP ON THE PHYSICS OF EXCITED NUCLEONS - NSTAR2011, 17-20 May 2011, Thomas Jefferson National Accelerator Facility Newport News, Virginia USA
82. **Dyson-Schwinger Equations and Continuum QCD**, presented at APPLICATIONS OF LIGHT-CONE COORDINATES TO HIGHLY RELATIVISTIC SYSTEMS – LIGHT CONE 2011, 23-27 May 2011, Southern Methodist University, Dallas, Texas

5.2 Invited Lecture Series (17)

1. Series of 2 lectures entitled “*Low Energy Hadron Phenomena*” and “*From a gluon propagator to hadronic observables*” at the RESEARCH WORKSHOP ON NON-PERTURBATIVE METHODS IN FIELD THEORY, National Centre for Theoretical Physics, Australian National University, 1-17 May, 1995.

2. Series of 5 Lectures entitled “*Dyson-Schwinger Equations: Dynamical Chiral Symmetry Breaking, and Hadron Observables*” presented at the 16TH UK INSTITUTE FOR THEORETICAL HIGH ENERGY PHYSICISTS, Swansea, Wales, 4-8 Sept., 1995.
3. Series of 3 Lectures entitled “*Dyson-Schwinger Equations: Dynamical Chiral Symmetry Breaking, and Hadron Observables*” presented at the Graduiertenkolleg: “Struktur und Wechselwirkung von Hadronen und Kernen”, University of Tübingen, Sept. 29 - Oct. 4, 1995.
4. Series of 3 Lectures entitled “*Dyson-Schwinger equations in QED and QCD*” presented at the INTERNATIONAL SCHOOL ON LIGHT-FRONT QUANTIZATION AND NON-PERTURBATIVE QCD, sponsored by the International Institute of Theoretical and Applied Physics, Ames, IA, May 6 - June 2, 1996.
5. Series of 3 Lectures entitled “*Hadron Physics: Nonperturbative Effects in QCD*” presented at the 13TH SUMMER SCHOOL IN NUCLEAR AND PARTICLE PHYSICS, Robertson, NSW, Australia, 9-14 Feb. 1997.
6. Series of 5 Lectures entitled “*Nonperturbative effects in QCD at finite temperature and density*” presented at the Research Workshop on DECONFINEMENT AT FINITE TEMPERATURE AND DENSITY, Dubna, Russia, 1-25 Oct. 1997.
7. Series of 3 Lectures entitled “*Nonperturbative QCD with Modern Tools*”, presented at the 11TH PHYSICS SUMMER SCHOOL, National Centre for Theoretical Physics, Australian National University, Canberra, ACT, Australia, 12-23 Jan. 1998.
8. Series of 2 Lectures entitled “*Nonperturbative QCD with Modern Tools*”, presented in the *Graduiertenkolleg* on PARTICLE- AND ASTRO-PHYSICS, University of Rostock, Rostock, Germany, 10-28 Apr. 2000
9. Series of 2 Lectures entitled “*Unifying light- and heavy-quark physics*”, presented at the INTERNATIONAL SCHOOL ON HEAVY-QUARK PHYSICS, Bogoliubov Laboratory for Theoretical Physics, Joint Institute for Nuclear Research, Dubna, Russia, 27/May-5/Jun./2002
10. Series of 5 Lectures entitled *Hadron Physics and Dyson-Schwinger Equations*, presented at the 20TH ANNUAL HAMPTON UNIVERSITY GRADUATE STUDIES PROGRAM, JLab, Newport News, VA, 31/May-17/Jun. 2005
11. Series of 3 Lectures entitled *Dyson-Schwinger Equations: From Gluons and Quarks to Reality*, presented at the HELMHOLTZ INTERNATIONAL SCHOOL ON HEAVY QUARK PHYSICS, Bogoliubov Laboratory of Theoretical Physics, Joint Institute for Nuclear Research, Dubna, 6-16 June, 2005
12. Series of 4 Lectures entitled *Aspects of Hadron Physics*, presented at the 44TH INTERNATIONAL UNIVERSITY FOR THEORETICAL PHYSICS: HADRON STRUCTURE AND NONPERTURBATIVE QCD, Schladming, Austria, 11-18 March, 2006.

13. Series of 4 lectures entitled *Hadron Physics from Dyson-Schwinger Equations* presented at the WORKSHOP ON DYSON-SCHWINGER EQUATIONS AND THEIR APPLICATIONS, Physics Department, Peking University, Beijing, China – August 14-18, 2007
14. Series of 2 lectures entitled *Modern Hadron Physics* presented at the ZHONGSHAN FORUM, Physics Department, Nanjing University, Nanjing, China – 24-26 June 2008
15. Series of 4 lectures entitled *Dyson-Schwinger Equations and QCD* presented at the 25TH STUDENT’S WORKSHOP ON ELECTROMAGNETIC INTERACTIONS, Bosen (Saar) Germany – 31 August - 5 September 2008
16. Series of 3 lectures entitled *Hadron Physics and Continuum Strong-QCD* presented at the MINI-SCHOOL OF XII MEXICAN WORKSHOP ON PARTICLES AND FIELDS, Physics Department of the University of Sinaloa, Culiacán, 4-8 November 2009
17. Five-hour lecture series entitled *Connecting mathematics with experiment* presented at DYSON-SCHWINGER EQUATIONS AND FAÀ DI BRUNO HOPF ALGEBRAS IN PHYSICS AND COMBINATORICS (DSFdB2011), Strasbourg, 27 June - 1 July, 2011

6 Other Written Contributions

Conference Proceedings	36
Books Edited	2

6.1 Conference Proceedings (36)

1. ROBERTS, C.D, CAHILL, R.T. and PRASCHIFKA, J.
Hadron dynamics from QCD
in *Relativistic Nuclear Many-Body Physics*, edited by B.C. Clark, R.J. Perry and J.P. Vary (World Scientific, Singapore, 1989) pp. 195-202.
2. ROBERTS, C.D.
Schwinger-Dyson Equations: Dynamical Chiral Symmetry Breaking and Confinement
in *QCD Vacuum Structure*, edited by H.M. Fried and B. Müller (World Scientific, Singapore 1993) pp. 114-133, hep-ph/9303278.
3. ROBERTS, C.D.
 π - π scattering in a QCD based model field theory
in *PAN XIII - Particles and Nuclei. Proceedings of the Thirteenth International Conference on Particles and Nuclei* (World Scientific, Singapore, 1994) pp. 229-231.
4. ROBERTS, C.D.
Can an infrared-vanishing gluon propagator confine quarks?
in *Quantum Infrared Physics*, Ed. H.M. Fried and B. Müller (World Scientific, Singapore, 1995) pp. 18-27, hep-ph/9408327.
5. ROBERTS, C.D.
Pion Observables and QCD
in *Chiral Dynamics: Theory and Experiment*, Springer Lecture Notes in Physics, Vol. 452, Ed. A.M. Bernstein and B.R. Holstein (Springer, New York, 1995) pp. 68-77, hep-ph/9408374.
6. ROBERTS, C.D.
Confinement, Diquarks and Goldstone's theorem
in *Quark Confinement and the Hadron Spectrum, II*, Ed. N. Brambilla and G.M. Prosperi (World Scientific, Singapore, 1997) pp. 224-230, nucl-th/9609039.
7. ROBERTS, C.D.
Dyson-Schwinger equations in QCD
in *Light-Front Quantization and Nonperturbative QCD*, eds. J.P. Vary and F. Wölz (IITAP Press, Ames, 1997), pp. 212-239, <http://www.phy.anl.gov/theory/staff/iitap.uu>.
8. MARIS, P. and ROBERTS, C.D.
Differences between heavy and light quarks

- in Proceedings of the *IVth International Workshop on Progress in Heavy Quark Physics*,
Eds. M. Beyer, T. Mannel and H. Schröder (University of Rostock Press, Rostock,
1998) pp. 159-162, nucl-th/9710062.
9. ROBERTS, C.D., IVANOV, M.A., KALINOVSKY, Yu.L. and MARIS, P.
Leptonic and semileptonic decays of heavy mesons
in Proceedings of the *IVth International Workshop on Progress in Heavy Quark Physics*,
Eds. M. Beyer, T. Mannel and H. Schröder (University of Rostock Press, Rostock,
1998) pp. 163-166, nucl-th/9710063
 10. ROBERTS, C. D.
Nonperturbative QCD with Modern Tools
in proceedings of the *11th Physics Summer School on Frontiers in Nuclear Physics:
From Quark-Gluon Plasma to Supernova*, edited by S. Kuyucak (World Scientific,
Singapore, 1999) pp. 212-261, nucl-th/9807026
 11. IVANOV, M.A., KALINOVSKY, Yu.L., MARIS, P. and ROBERTS, C D.
Heavy Meson Observables and Dyson-Schwinger Equations
in Proceedings of the *International Conference on Problems of Quantum Field Theory*,
JINR, Dubna, Russia, July, 1998, 11 pages, nucl-th/9810010.
 12. ROBERTS, C.D. and SCHMIDT, S.M.
Dyson-Schwinger equations and the quark gluon plasma
in Proceedings of the *International Workshop on Understanding Deconfinement in
QCD*, edited by D. Blaschke, F. Karsch and C.D. Roberts (World Scientific, Singapore,
2000) pp. 183-195, nucl-th/9903075.
 13. IVANOV, M.A., KALINOVSKY, Yu.L. and ROBERTS, C.D.
Heavy meson observables
in Proceedings of the *International Workshop on Understanding Deconfinement in
QCD*, edited by D. Blaschke, F. Karsch and C.D. Roberts (World Scientific, Singapore,
2000) pp. 231-233, nucl-th/9904021.
 14. ROBERTS, C.D. and SCHMIDT, S.M.
Temperature, chemical potential and the ρ -meson
in Proceedings of *International Workshop XXVIII on Gross Properties of Nuclei and
Nuclear Excitations*, Hirschegg, Austria, 2000, nucl-th/0002004.
 15. IVANOV, M.A., KALINOVSKY, Yu.L. and ROBERTS, C.D.
Heavy Meson Observables via Dyson-Schwinger Equations
in Proceedings. of the *5th International Workshop on Heavy Quark Physics*, edited by
M.A. Ivanov, V.E. Lyubovitskij and E. Lipartia (JINR Publishing, Dubna, Russia,
2002) pp. 95-102, hep-ph/0006189.
 16. ROBERTS, C. D.
**Continuum Strong QCD:
Confinement and Dynamical Chiral Symmetry Breaking**
to appear in the Proceedings of *Confinement*, Erwin Schrödinger Institute, Vienna,
Austria, 5 May - 17 Jul. 2000, nucl-th/0007054.

17. HECHT, M.B., ROBERTS, C.D. and SCHMIDT, S.M.
Contemporary Applications of Dyson-Schwinger Equations
in Proceedings of the *4th International Conference on Quark Confinement and the Hadron Spectrum*, edited by W. Lucha and Kh. Maung Maung (World Scientific, Singapore, 2002) pp. 27-39, nucl-th/0010024.
18. S. Capstick *et al.*,
Key issues in hadronic physics
Presented at APS Division of Nuclear Physics Town Meeting on Electromagnetic and Hadronic Physics, Newport News, Virginia, 1-4 Dec 2000. [hep-ph/0012238](#)
19. HECHT, M.B., ROBERTS, C.D. and SCHMIDT, S.M.
Diquarks and Density
in *Physics of Neutron Star Interiors*, edited by D. Blaschke, N.K. Glendenning and A. Sedrakian (Springer-Verlag, Berlin Heidelberg, 2001) pp. 218-234, nucl-th/0012023.
20. PROZORKEVICH, A.V., VINNIK, D.V., SCHMIDT, S.M., HECHT, M.B. and ROBERTS, C.D.
Pair creation and plasma oscillations
in *Exploring Quark Matter*, edited by G.R.G. Burau, D.B. Blaschke and S.M. Schmidt (University of Rostock Press, Rostock, 2001) pp. 109-122, nucl-th/0012039.
21. ROBERTS, C.D.
Aspects of dynamical chiral symmetry breaking
in *Quark Confinement and the Hadron Spectrum V*, edited by N. Brambilla and G.M. Prosperi (World Scientific, Singapore, 2003) pp. 150-168, nucl-th/0301065.
22. ROBERTS, C.D.
Unifying aspects of light- and heavy-systems
in *Heavy Quark Physics*, Lecture Notes in Physics, Vol. 647, edited by D. Blaschke, M.A. Ivanov and T. Mannel (Springer Verlag, Berlin, 2004) pp. 149-188, nucl-th/0304050.
23. HÖLL, A., KRASSNIGG, A. AND ROBERTS, C.D.
DSEs and pseudoscalar mesons: an aperçu
nucl-th/0311033, in the Proceedings of “LC03: Light Cone Workshop - Hadrons and Beyond,” Grey College, University of Durham, 5-9/August/2003, edited by S. Dalley, <http://www.mpi-hd.mpg.de/ilcac/Durham03/lc03proc.html>
24. BHAGWAT, M.S. and ROBERTS, C.D.
Chiral dynamics from Dyson-Schwinger equations
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28. Lei Chang and Craig D. Roberts
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30. Hannes L.L. Roberts, Lei Chang and Craig D. Roberts
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32. Lei Chang, Ian C. Cloët, Craig D. Roberts and Hannes L.L. Roberts
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33. Si-xue Qin, Lei Chang, Yu-xin Liu and Craig D. Roberts
Quark Spectral Function above T_c

[AIP Conf. Proc. 1354 \(2011\) pp. 220-223](#)

Contribution to the proceedings of “T(r)opical QCD 2010: Cairns CSSM 2010 Workshop,” Cairns Colonial Club, Cairns, Australia, 26 September - 1 October

34. Ian C. Cloët, Craig D. Roberts and David J. Wilson

Baryon Properties from Continuum-QCD

[arXiv:1103.2432 \[nucl-th\]](#)

Contribution to the Proceedings of the “International Conference on the Structure of Baryons - Baryons 2010,” Suita Campus, Osaka University, Japan 7-11 December 2010

35. Craig D. Roberts

Opportunities and Challenges for Theory in the N^* program

[arXiv:1108.1030 \[nucl-th\]](#)

Contribution to the Proceedings of “NSTAR2011 - The 8th International Workshop on the Physics of Excited Nucleons,” Thomas Jefferson National Accelerator Facility, Newport News, Virginia USA, 17-20 May 2011

36. Craig D. Roberts, Ian C. Cloët, Lei Chang and Hannes L.L. Roberts

Dressed-quarks and the Roper resonance

[arXiv:1108.1327 \[nucl-th\]](#)

Contribution to the Proceedings of “NSTAR2011 - The 8th International Workshop on the Physics of Excited Nucleons,” Thomas Jefferson National Accelerator Facility, Newport News, Virginia USA, 17-20 May 2011

6.2 Books Edited (2)

1. **Understanding Deconfinement in QCD,**

edited by D. Blaschke, F. Karsch and C.D. Roberts
(World Scientific, Singapore, 2000) 354 pages.

2. **Opportunities with Exotic Beams,**

edited by Thomas Duguet, Henning Esbensen, Kenneth M Nollett and Craig D Roberts
(World Scientific, Singapore, 2007) 248 pages.

7 Record of Support

Key:

CR – Continuing Resolution

IWO – EBAC – Inter-entity Work Order Funds; Thomas Jefferson National Accelerator Facility

LDRD – Argonne National Laboratory Director’s Research and Development Grant

OTD – Office of the Director, Argonne National Laboratory

ROLE	TITLE	SPONSOR	DATE(s)	AMOUNT [Actual \$k]
Principal Investigator	Nuclear Theory	Department of Energy	CR-2011	2,126
Principal Investigator	Nuclear Theory	Department of Energy	2010	2,126
Co-Principal Investigator (P.C. Tandy, Kent State U)	Mexico-USA Collaborative Travel Grant	National Science Foundation	2009 -2010	15
Principal Investigator	Nuclear Theory	Department of Energy	2009	2,027
Co-Principal Investigator (J.W. Truran, (ANL-PHY & UChicago)	Explosive Nucleosynthesis of Heavy Elements	ANL LDRD	2009 -2011	239
Principal Investigator	Director’s Postdoctoral Fellowship – Obtained for H. Grigoryan	OTD	2008 -2010	309
Principal Investigator	Nuclear Theory	Department of Energy	2008	2,146
Co-Principal Investigator (J.W. Truran, K.M. Nol- lett, K.E. Rehm, G. Savard, R.J. Holt – ANL- PHY)	Nuclear Astrophysics	ANL LDRD	2008 -2010	358
Principal Investigator	SciDAC - UNEDF	Department of Energy	2007 -2010 continuing	399
Principal Investigator	Named Postdoctoral Fellowship – Obtained for R.D. Young	OTD	2007 -2010	264

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ROLE	TITLE	SPONSOR	DATE(s)	AMOUNT [Actual \$k]
Principal Investigator	Gordon Godfrey Fellowship	Gordon Godfrey Fund and Australian Research Council	2008	7
Principal Investigator	Nuclear Theory	Department of Energy	2007	1,578
Co-Principal Investigator (D.K. Sinclair, C.E.M. Wagner C. Zachos – ANL-HEP; D. Kutasov, J. Harvey – U.Chicago)	Strong Dynamics and Dynamical Chiral Symmetry Breaking	ANL LDRD	2007 -2009	392
Co-Principal Investigator (A.G. Williams, A. Kizilersu, D.B. Leinweber, L. von Smekal - U. Adelaide, Australia; R. Alkofer - U. Graz, Austria; M.R. Pennington - Durham U., UK; J.I. Skullerud - U. Ireland; A. Szczepaniak - Indiana U.; P.C. Tandy - Kent State U.; A.W. Thomas - JLab)	Advances in Nonperturbative Studies in of Subatomic Physics	Australian Research Council, Linkage International Award	2007 -2009	74
Principal Investigator	Nuclear Theory	Department of Energy	2006	1,483
Co-Principal Investigator J.W. Truran, (ANL-PHY & UChicago)	Nuclear Theory for Supernovae	ANL LDRD	2006 -2008	619
Co-Principal Investigator (K.M. Nollett & R.B. Wiringa, ANL)	Advancing Nuclear Theory for a Rare Isotope Accelerator: Nuclear Structure and Reactions for Astrophysics	ANL LDRD	2006 -2008	347
Principal Investigator	IWO – EBAC	ANL ALD-PBCS	2006 -2009 continuing	478
Principal Investigator	Fellowships for Minorities	ANL ALD-PBCS	2006 -2007	90
Principal Investigator	Nuclear Theory	Department of Energy	2005	1,496

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ROLE	TITLE	SPONSOR	DATE(s)	AMOUNT [Actual \$k]
Co-Principal Investigator (J.W. Truran, (ANL-PHY & UChicago)	Nuclear Theory for Supernovae”	ANL LDRD	2005	170
Principal Investigator	Argonne Fellowship – Obtained for V.V. Flambaum (UNSW)	OTD	2005 -2007	178
Co-Principal Investigator (T.-S.H. Lee, ANL)	New Theoretical Tools for Nucleon Resonance Analysis	ANL LDRD	2005	30
Principal Investigator	Nuclear Theory	Department of Energy	2004	1,496
Principal Investigator	Hadron Physics: Modern Methods for Modern Challenges	ANL LDRD	2004	10
Principal Investigator	Visiting Scientist Support for Nuclear Structure	ANL LDRD	2004	40
Principal Investigator	Nuclear Theory	Department of Energy	2003	1,477
Principal Investigator	Bessel Research Prize	Humboldt Foundation, Germany	2003 -2005	46
Principal Investigator	Nuclear Theory	Department of Energy	2002	1,434
Co-Principal Investigator (P.C. Tandy, KSU)	Quark Confinement and Hadronic Processes	National Science Foundation, International Programs	2002 -2003	20
Principal Investigator	J/ψ Suppression as a Signal of Quark-Gluon Plasma Formation	Deutsche Forschungsgemein- schaft, Germany	2001	24
Co-Principal Investigator (P.C. Tandy, KSU)	Hadron Observables at Finite Temperature and Baryon Density	National Science Foundation, International Programs	1997 -1999	24

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ROLE	TITLE	SPONSOR	DATE(s)	AMOUNT [Actual \$k]
Principal Investigator	Nucleon Amplitudes in QCD	ANL LDRD	1995	59
Co-Principal Investigator (P.C. Tandy, KSU)	Studies in Nonperturbative QCD and Hadron Dynamics	National Science Foundation, International Programs	1993 -1995	24

34 awards/grants for a total of \$21,605 k